thereby excite said working gas into a plasma to sputter said metal from said target onto said working substrate.

7. The method of Claim 6, wherein said metal comprises aluminum.

8. The method of Claim 6, wherein said metal comprises copper.

9. The method of Claim 6, wherein said metal comprises titanium.

10. (Already Amended) The method of Claim 6, wherein an integrated magnetic flux produced by said outer pole is at least 2.0 times an integrated magnetic flux produced by said inner pole.

11. (Thrice Amended) An tungsten fill process, comprising the steps of:

placing a substrate containing a hole formed in a dielectric layer in a magnetron sputter reactor including a titanium target and a magnetron comprising an inner pole of a first magnetic polarity and producing a first total magnetic flux and an outer pole of an opposite second magnetic polarity, producing a second total magnetic flux at least 1.5 times said first magnetic flux, and surrounding said first magnetic pole;

in said magnetron sputter reactor, sputtering a barrier layer of titanium and titanium nitride into said hole while rotating said magnetron about a center of said titanium target; and

thereafter filling tungsten into said hole of said substrate;

wherein there is no annealing step between said sputtering and filling steps.

Please cancel Claims 12 and 13.

14. The process of Claim 11, wherein said filling is performed by chemical vapor deposition.

15. The process of Claim 11, wherein said filling is performed by sputtering.

16. The process of Claim 11, further comprising rotating said magnetron about a back of said target.

17. (Amended) A tungsten fill process, comprising the steps of:

placing a substrate containing a hole formed in a dielectric layer in a magnetron sputter reactor including a titanium target and a magnetron comprising an inner pole of a first magnetic polarity and producing a first total magnetic flux and an outer pole of an opposite second magnetic polarity, producing a second total magnetic flux at least 1.5 times said first magnetic flux, and surrounding said first magnetic pole;

in said magnetron sputter reactor, sputtering a barrier layer of titanium and titanium nitride into said hole while rotating said magnetron in back of and about a center of said titanium target, wherein said magnetron is asymmetric about an axis about which said magnetron is rotated; and

thereafter filling tungsten into said hole of said substrate.

18. The method of Claim 6, wherein an amount of said DC power is no more than 18kW normalized to a circular reference substrate of 200mm diameter.

19. (Amended) The method of Claim 6, wherein an amount of said DC power in combination with a size and magnetic strength of said inner and outer poles is sufficient to achieve an ionization density of said metal of at least 20%.

20. The method of Claim 6, wherein said metal is a barrier metal.

21. A method of sputtering a material from a target comprising a metal onto a working substrate supported on a pedestal in a system including a magnetron disposed on a side of said target opposite said pedestal and including an outer pole of one magnetic polarity and surrounding an inner pole of another magnetic polarity and being asymmetric about a center of said target, said method comprising:

rotating said magnetron about said center of said target to achieve full sputtering coverage of said target; and

capacitively coupling power into said chamber at least partially by applying DC power to said target and exciting said working gas into a plasma to sputter said metal from said target onto said working substrate.

22. The method of Claim 21, wherein said magnetron has a generally triangular shape with an apex closer said center of said target than to a periphery thereof.

23. The method of Claim 21, wherein an amount of DC power applied to said target is sufficient to achieve an ionization density of at least 20%.

24. The method of Claim 23, wherein said metal is a barrier metal.

25. The method of Claim 21, wherein said metal is a barrier metal.

26. The method of Claim 21, wherein said working gas is excited into said plasma without inductively coupling power into said chamber.

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27. (New) The method of Claim 21, wherein said outer pole is neither circular nor oval shaped about an axis offset from said center of said target.

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